

WE CLAIM:

1. A method of producing a chewing gum product containing a physically-modified N-substituted derivative of aspartame in order to control the release rate of the N-substituted derivative of aspartame comprising the steps of:

a) mixing a quantity of a N-substituted derivative of aspartame with a modifying agent;

b) adding a quantity of the mixture to a chewing gum formulation to provide an N-substituted derivative of aspartame level in the chewing gum formulation of from about 0.0001% to about 0.1%.

2. The method of Claim 1 wherein said modifying agent is an encapsulating agent.

3. The method of Claim 1 wherein the N-substituted derivative of aspartame and encapsulating agent are also mixed with a solvent and the resulting mixture is dried prior to being added to the chewing gum.

4. The method of Claim 3 wherein the encapsulating material is selected from the group consisting of maltodextrin and gum arabic.

5. The method of Claim 3 wherein the mixture is spray dried and the solvent is selected from the group consisting of alcohol and water.

6. The method of Claim 1 wherein an additional high-potency sweetener selected from the group consisting of aspartame, alitame, salts of acesulfame, cyclamate and its salts, saccharin and its salts, sucralose, thaumatin, monellin, dihydrochalcone, glycyrrhizin, stevioside and combinations thereof is mixed in the mixture in combination with the N-substituted derivative of aspartame.

7. The method of Claim 1 wherein the N-substituted derivative of aspartame is selected from the group consisting of:

a) N-[N-(3,3-dimethylbutyl)-L- α -aspartyl]-L-phenylalanine 1-methyl ester;

b) N-[N-[3-(4-hydroxy-3-menthoxyphenyl)propyl]-L- α -aspartyl]-L-phenylalanine 1-methyl ester; and

5 c) N-[N-(3-phenylpropyl)-L- α -aspartyl]-L-phenylalanine 1-methyl ester.

8. The method of Claim 2 wherein the N-substituted derivative of aspartame is fluid-bed coated with a solution of encapsulating agent and solvent in order to modify the rate of release of the N-substituted derivative of aspartame in the chewing gum.

9. The method of Claim 8 wherein the solvent is selected from the group consisting of alcohol and water.

10. The method of Claim 8 wherein the encapsulating material is selected from the group consisting of shellac and Zein.

11. The method of Claim 8 wherein an additional high-potency sweetener selected from the group consisting of aspartame, alitame, salts of acesulfame, cyclamate and its salts, saccharin and its salts, sucralose, thaumatin, monellin, dihydrochalcone, glycyrrhizin, stevioside, and combinations thereof is mixed in the mixture in combination with the N-substituted derivative of aspartame.

12. The method of Claim 8 wherein the N-substituted derivative of aspartame is selected from the group consisting of:

a) N-[N-(3,3-dimethylbutyl)-L- α -aspartyl]-L-phenylalanine 1-methyl ester;

25 b) N-[N-[3-(4-hydroxy-3-menthoxyphenyl)propyl]-L- α -aspartyl]-L-phenylalanine 1-methyl ester; and

c) N-[N-(3-phenylpropyl)-L- α -aspartyl]-L-phenylalanine 1-methyl ester.

13. The method of Claim 2 wherein the N-substituted derivative of aspartame is encapsulated by coacervation in order to modify the rate of release of the N-substituted derivative of aspartame in chewing gum.

5 14. The method of Claim 2 wherein the N-substituted derivative of aspartame is mixed with a molten encapsulating agent and the N-substituted derivative of aspartame is encapsulated by spray chilling in order to modify the rate of release of the N-substituted derivative of aspartame in the chewing gum.

10 15. The method of Claim 14 wherein the encapsulating agent comprises wax.

15 16. The method of Claim 2 wherein the N-substituted derivative of aspartame is mixed with a polymer as the encapsulating agent and the resulting mixture is extruded into fibers in such a way as to encapsulate the N-substituted derivative of aspartame in order to modify the rate of release of the N-substituted derivative of aspartame in the chewing gum.

17. The method of Claim 16 wherein the polymer is selected from the group consisting of PVAC, hydroxypropyl cellulose, polyethylene and plastic polymers.

20 18. A method of producing a chewing gum containing a physically-modified N-substituted derivative of aspartame in order to control the release rate of the N-substituted derivative of aspartame comprising the steps of:

- 25 a) mixing a quantity of the N-substituted derivative of aspartame with an agglomerating agent and a solvent to partially coat the N-substituted derivative of aspartame;
- b) removing the solvent from the mixture of N-substituted derivative of aspartame and agglomerating agent to form a dried material; and
- c) adding a quantity of the dried material to a chewing gum formulation to provide an N-substituted derivative of aspartame level in gum of from about 0.0001% to about 0.1%.

19. The method of Claim 18 wherein the level of coating on the agglomerated N-substituted derivative of aspartame is at least about 5%.

20. The method of Claim 18 wherein the level of coating on the agglomerated N-substituted derivative of aspartame is at least about 15%.

5 21. The method of Claim 18 wherein the N-substituted derivative of aspartame is selected from the group consisting of:

 a) N-[N-(3,3-dimethylbutyl)-L- α -aspartyl]-L-phenylalanine 1-methyl ester;

 b) N-[N-[3-(4-hydroxy-3-menthoxyphenyl)propyl]-L- α -
10 aspartyl]-L-phenylalanine 1-methyl ester; and

 c) N-[N-(3-phenylpropyl)-L- α -aspartyl]-L-phenylalanine 1-methyl ester.

22. The method of Claim 18 wherein the dried material is ground to a powder prior to adding the dried material to the chewing gum.

15 23. The method of Claim 1 wherein the N-substituted derivative of aspartame is mixed with an absorbent as the modifying agent.

24. A method of producing a chewing gum product containing a N-substituted derivative of aspartame wherein the N-substituted derivative of aspartame is a part of a rolling compound applied on the chewing gum
20 product.

25. The method of Claim 24 wherein the N-substituted derivative of aspartame is selected from the group consisting of:

 a) N-[N-(3,3-dimethylbutyl)-L- α -aspartyl]-L-phenylalanine 1-methyl ester;

 b) N-[N-[3-(4-hydroxy-3-menthoxyphenyl)propyl]-L- α -
25 aspartyl]-L-phenylalanine 1-methyl ester; and

c) N-[N-(3-phenylpropyl)-L- α -aspartyl]-L-phenylalanine 1-methyl ester.

26. A method of producing a chewing gum product containing a N-substituted derivative of aspartame wherein the N-substituted derivative of aspartame is a part of a coating on a chewing gum pellet.

27. The method of Claim 26 wherein the N-substituted derivative of aspartame is selected from the group consisting of:

a) N-[N-(3,3-dimethylbutyl)-L- α -aspartyl]-L-phenylalanine 1-methyl ester;

b) N-[N-[3-(4-hydroxy-3-menthoxyphenyl)propyl]-L- α -aspartyl]-L-phenylalanine 1-methyl ester; and

c) N-[N-(3-phenylpropyl)-L- α -aspartyl]-L-phenylalanine 1-methyl ester.

28. A method of producing a chewing gum product containing a physically-modified N-substituted derivative of aspartame in order to control the release rate of the N-substituted derivative of aspartame comprising the steps of

a) mixing a quantity of N-substituted derivative of aspartame with a bulking agent;

b) treating the mixture of N-substituted derivative of aspartame and bulking agent so as to modify the release rate of N-substituted derivative of aspartame and bulking agent from chewing gum; and

c) adding a quantity of the treated mixture to a chewing gum formulation to provide an N-substituted derivative of aspartame level in the chewing gum formulation of from about 0.0001% to about 0.1%.

29. The method of Claim 28 wherein the N-substituted derivative of aspartame is selected from the group consisting of:

a) N-[N-(3,3-dimethylbutyl)-L- α -aspartyl]-L-phenylalanine 1-methyl ester;

b) N-[N-[3-(4-hydroxy-3-menthoxyphenyl)propyl]-L- α -aspartyl]-L-phenylalanine 1-methyl ester; and

c) N-[N-(3-phenylpropyl)-L- α -aspartyl]-L-phenylalanine 1-methyl ester.

- 5 30. The method of claim 1 wherein the N-substituted derivative of aspartame comprises N-[N-(3,3-dimethylbutyl)-L- α -aspartyl]-L-phenylalanine 1-methyl ester.